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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,064	04/01/2004	Bruno Kristiaan Bernard De Man	127068-2	8882

7590 08/23/2005

General Electric Company  
CRD Patent Docket Rm 4A59  
Bldg. K-1  
P.O. Box 8  
Schenectady, NY 12301

EXAMINER

SONG, HOON K

ART UNIT PAPER NUMBER

2882

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No. 10/816,064	Applicant(s) DE MAN ET AL.	
	Examiner Hoon Song	Art Unit 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2005.  
2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-58 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-5, 28-31, 44 and 48 is/are rejected.  
7) ☒ Claim(s) 6-27, 32-43, 45-47 and 49-58 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 01 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 28-31, 44 and 48 are rejected under 35 U.S.C. 102(e) as being anticipated by Mihara et al. (US 6731716B2).

Regarding claim 1, Mihara teaches a volumetric stationary CT system comprising:

at least one stationary detector (12) extending generally around at least a portion of an imaging volume;

at least one stationary distributed X-ray source (22) placed proximal to the at least one stationary detector (12) (figure 3); and

a source controller for triggering one or more emitters in the at least one stationary distributed x-ray source for acquiring volumetric data by the at least one stationary detector (column 6 line 44-67),

wherein the at least one stationary detector (12) and the at least one stationary distributed X-ray source (22) are configured to cooperate to contribute towards

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mathematical completeness (360° scanning )of acquired volumetric data for image reconstruction (column 6 line 44-67).

Regarding claim 2, Mihara teaches the at least one stationary distributed X-ray source comprises thermionic emitters (21).

Regarding claim 3, Mihara teaches a plurality of detector elements of one or more sizes placed in the at least one stationary detector (12).

Regarding claim 4, Mihara teaches the at least one stationary distributed X-ray source includes one or more full ring sources (22).

Regarding claim 5, Mihara teaches the one or more full ring sources include a circle configuration (figure 3).

Regarding claim 28, Mihara teaches an X-ray imaging system for scanning a volume to be imaged, the system comprising:

at least one stationary distributed X-ray source (22) extending generally around at least a portion of an imaging volume and configured to emanate an X-ray radiation (R);

at least one stationary detector (12) for receiving the x-ray radiation after attenuation in the imaging volume and placed proximal to the at least one stationary distributed x-ray source (22) (figure 3);

a control circuit operably coupled to the at least one distributed X-ray source; wherein the control circuit is configured for triggering one or more emitters in the at least one stationary distributed x-ray source for acquiring volumetric data by the at least one stationary detector (column 6 line 44-67);

a processing circuit operably coupled to the at least one detector (12) and configured to receive the plurality of projection images and to form one or more reconstructed slices representative of the volume being imaged (column 6 line 44-67); and

an operator workstation operably coupled to the processing circuit configured to display the one or more reconstructed slices (column 6 line 44-67),

wherein the at least one stationary detector (12) and the at least one stationary distributed X-ray source (22) are configured to cooperate to contribute towards mathematical completeness (360° scanning) in acquired volumetric data for image reconstruction (column 6 line 44-67).

Regarding claim 29, Mihara teaches the at least one stationary distributed X-ray source comprises thermionic emitters (21)

Regarding claim 30, Mihara teaches a plurality of detector elements of one or more sizes placed in the at least one stationary detector (12).

Regarding claim 31, Mihara teaches the at least one stationary distributed X-ray source includes one or more full ring sources (figure 3).

Regarding claim 44, Mihara teaches a method of X-ray imaging comprising:  
providing at least one stationary detector (12) extending generally around at least a portion of an imaging volume (figure 3);

providing at least one stationary distributed X-ray source (22) placed adjacent to the at least one detector (12) configured to emit radiation toward the detector (12); and

providing a source controller for triggering one or more emitters in the at least one stationary distributed x-ray source for acquiring volumetric data by the at least one stationary detector (column 6 line 44-67),

wherein the at least one stationary detector and the at least one stationary distributed X-ray source are configured to cooperate to contribute towards mathematical completeness ( $360^\circ$  scanning ) of acquired volumetric data for image reconstruction (column 6 line 44-67).

Regarding claim 48, Mihara teaches reducing scatter by using small cone angles for the distributed X-ray source (figure 4).

***Allowable Subject Matter***

Claims 6-27, 32-43, 45-47 and 49-58 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 6-7, the prior art fails to teach the at least one stationary detector includes a pair of ring detectors and wherein at least one ring source of the one or more full ring sources is positioned between the pair of ring detectors as claimed in dependent claim 6.

Regarding claims 8-15 the prior art fails to teach the at least one stationary detector includes one or more ring detectors placed between two or more ring sources as claimed in dependent claim 8.

Regarding claim 16, the prior art fails to teach one or more partial ring sources and wherein the at least one stationary detector includes one or more ring detectors positioned between two or more ring sources and includes the one or more partial ring sources as claimed in dependent claim 16.

Regarding claim 17, the prior art fails to teach the at least one stationary detector includes one or more ring detectors positioned between two or more ring sources, wherein the one or more ring detectors and the two or more ring sources comprise different diameters for permitting a telescoping movement of the one or more ring detectors with the two or more ring sources as claimed in dependent claim 17.

Regarding claim 18, the prior art fails to teach one or more line sources extending at least along a Z-direction to increase completeness in acquired data for image reconstruction as claimed in dependent claim 18.

Regarding claims 19-20, the prior art fails to teach the at least one stationary detector includes a ring detector and wherein the at least one stationary distributed X-ray source includes one or more partial ring sources flanking the ring detector on alternating sides of the ring detector and configured to emit radiation toward the ring detector as claimed in dependent claim 19.

Regarding claims 21-25, the prior art fails to teach the at least one stationary distributed X-ray source includes one or more partial ring sources and wherein the at least one stationary detector includes one or more notched detectors as claimed in dependent claim 21.

Regarding claims 26-27, the prior art fails to teach the at least one stationary detector includes a helical detector, and wherein the at least one stationary distributed X-ray source includes a helical source placed adjacent to the helical detector as claimed in dependent claim 26.

Regarding claims 32 and 33, the prior art fails to teach the at least one stationary detector includes a pair of ring detectors and wherein at least one ring source of the one or more full ring sources is positioned between the pair of ring detectors.

Regarding claims 34-37, the prior art fails to teach the at least one stationary detector includes one or more ring detectors placed between two or more ring sources as claimed in dependent claim 34.

Regarding claim 38, the prior art fails to teach one or more partial ring sources and wherein the at least one stationary detector includes one or more ring detectors positioned between two or more ring sources and includes one or more partial ring sources as claimed in dependent claim 38.

Regarding claim 39, the prior art fails to teach the at least one stationary detector includes one or more ring detectors positioned between two or more ring sources, wherein the one or more ring detectors and the two or more ring sources comprise different diameters for permitting a telescoping movement of the one or more ring detectors with the two or more ring sources.

Regarding claim 40, the prior art fails to teach one or more line sources extending at least along a Z-direction to increase completeness in acquired data for image reconstruction as claimed in dependent claim 40.



Regarding claim 41, the prior art fails to teach the at least one stationary detector includes a ring detector and wherein the at least one stationary distributed X-ray source includes one or more partial ring sources flanking the ring detector on alternating sides of the ring detector and configured to emit radiation toward the ring detector as claimed in dependent claim 41.

Regarding claim 42, the prior art fails to teach the at least one stationary distributed X-ray source includes one or more partial ring sources and wherein the at least one stationary detector includes one or more notched detectors as claimed in dependent claim 42.

Regarding claim 43, the prior art fails to teach the at least one stationary detector includes a helical detector, and wherein the at least one stationary distributed X-ray source includes a helical source placed adjacent to the helical detector as claimed in dependent claim 43.

Regarding claim 45, the prior art fails to teach a method of measuring additional data by employing line sources as claimed in dependent claim 45.

Regarding claims 46-47, the prior art fails to teach providing one or more ring detectors placed between two or more ring sources as claimed in dependent claim 46.

Regarding claims 49-50, the prior art fails to teach the at least one stationary distributed X-ray source includes at least two ring sources and the at least one stationary detector includes one or more ring detectors, and wherein at least one of a source and a detector is configured to make a telescopic movement for allowing adaptive Z-coverage as claimed in dependent claim 49.

Regarding claim 51, the prior art fails to teach one or more partial ring sources and wherein the at least one stationary detector includes one or more ring detectors positioned between two or more ring sources and includes the one or more partial ring sources as claimed in dependent claim 51.

Regarding claim 52-53, the prior art fails to teach the at least one stationary detector includes a ring detector and wherein the at least one stationary distributed X-ray source includes one or more partial ring sources flanking the ring detector on alternating sides of the ring detector and configured to emit radiation toward the ring detector as claimed in dependent claim 52.

Regarding claims 54-55, the prior art fails to teach the at least one stationary distributed X-ray source includes one or more partial ring sources and wherein the at least one stationary detector includes one or more notched detectors as claimed in dependent claim 54.

Regarding claim 56, the prior art fails to teach the at least one stationary detector includes a helical detector, and wherein the at least one stationary distributed X-ray source includes a helical source placed adjacent to the helical detector as claimed in dependent claim 56.

Regarding claims 57-58, the prior art fails to teach the at least one stationary detector includes a pair of ring detectors and wherein at least one ring source of the one or more full ring sources is positioned between the pair of ring detectors as claimed in dependent claim 57.

***Response to Arguments***

Applicant's arguments with respect to claims 1-5, 28-31, 44 and 48 have been considered but are moot in view of the new ground(s) of rejection.

**Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is (571) 272-2494. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272 - 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HKS

6/17/05  
HKS



DAVID V. BRUCE  
PRIMARY EXAMINER

<b>Notice of References Cited</b>	Application/Control No. 10/816,064	Applicant(s)/Patent Under Reexamination DE MAN ET AL.	
	Examiner Hoon Song	Art Unit 2882	Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,731,716	05-2004	Mihara et al.	378/4
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
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**FOREIGN PATENT DOCUMENTS**

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**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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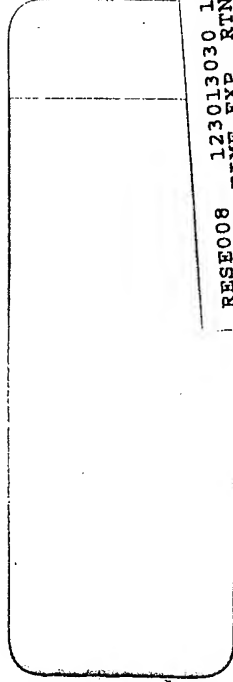
\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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